

**Remarks**

This Amendment is responsive to the March 6, 2009 Office Action. Reexamination and reconsideration of the pending claims is respectfully requested.

**Summary of the Office Action**

**Claims 1-20** were rejected under 35 U.S.C. 103(a) as being unpatentable over Ateshian et al. (US 6,126,690).

**Amendments to the Claims**

Amendments to the claims find support in the Present Application's Specification. Therefore, no new matter has been added.

**Claim 1**

Claim 1 was amended to replace "a medical device" with "an implant." Support for the amendment may be found in the Specification of the Present Application at least in page 15, lines 19 - 28.

Claim 1 was amended to add "of a volume." Support for the amendment may be found in the Specification of the Present Application at least in page 14, lines 10 - 30.

Claim 1 was amended to replace "defective portion" with "missing segment." Support for the amendment may be found in the Specification of the Present Application at least in page 1, lines 5 - 11.

Claim 1 was amended to add "deformable." Support for the amendment may be found in the Specification of the Present Application at least in page 34, line 1 - page 45, line 22.

Claim 1 was amended to add "where the template comprises a wireframe including ridge curves and tiling curves." Support for the amendment may be found in the Specification of the Present Application at least in page 32, line 24 - page 33, line 29.

Claim 1 was amended to add "where the superimposing includes deforming the deformable template." Support for the amendment may be found in the Specification of the Present Application at least in page 34, line 1 - page 45, line 22.

Claim 1 was amended to add "where the implant is configured to fit within the contours of the missing segment." Support for the amendment may be found in the Specification of the Present Application at least in page 1, lines 5 - 11.

**Claim 10**

Claim 10 was amended to add "within the image." Support for the amendment may be found in the Specification of the Present Application at least in page 16, line 5 - page 31, line 29.

Claim 10 was amended to add “where the template is configured to deform to span the defective portion.” Support for the amendment may be found in the Specification of the Present Application at least in page 34, line 1 - page 45, line 22.

Claim 10 was amended to add “where the template comprises a wireframe formed of ridge-curves and tiling-curves.” Support for the amendment may be found in the Specification of the Present Application at least in page 32, line 24 - page 33, line 29.

Claim 18

Claim 18 was amended to add “where the template comprises a wireframe derived from ridge-curves and geodesic lines.” Support for the amendment may be found in the Specification of the Present Application at least in page 32, line 24 - page 33, line 29.

Claim 18 was amended to add “where the implant is configured to fit within the contours of the defective portion.” Support for the amendment may be found in the Specification of the Present Application at least in page 1, lines 5 - 11.

Claims 2-9 and 13

Claims 2-9 and 13 have been amended to correct typographical errors, antecedents, or generally to making cosmetic changes. No new matter has been added.

**Claim Rejections under 35 U.S.C. § 103****The claims patentably distinguish over the reference of record**

MPEP Section 2143.03 requires the consideration of every claim feature in an obviousness determination. “All words in a claim must be considered in judging the patentability of that claim against the prior art.” MPEP 2143.03 (citing *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970)).

The Board of Patent Appeals and Interferences recently explained that the determination of §103 obviousness requires consideration of all the limitations in the patent claim.

When determining whether a claim is obvious, an examiner must make “a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art.” *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, “obviousness requires a suggestion of all limitations in a claim.” *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (citing *In re Royka*, 490 F.2d 981, 985 (CCPA 1974)). Moreover, as the Supreme Court recently stated, “*there must be some articulated reasoning* with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (emphasis added))...

It is well settled that the “Patent and Trademark Office (PTO) must consider all claim limitations when determining patentability of an invention over the prior art.” *In re Lowry*, 32 F.3d 1579, 1582 (Fed. Cir. 1994).

*Ex parte Wada and Murphy*, Appeal 2007-3733 (BPAI January 14, 2008).

In sum, it remains well-settled law that obviousness requires at least a suggestion of all of the features in a claim. *See Id.*

**Claims 1-20** were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,126,690 to Ateshian et al. (“Ateshian”).

The claims will now be discussed independently.

**Claim 1**

Claim 1, as amended, is directed to a method for determining a shape of an implant to be implanted into a subject.

Amended claim 1 recites “superimposing a deformable template representing a normative shape of an external surface of the hard tissue of interest to span the missing segment, where the template comprises a wireframe including ridge curves and tiling curves, and where the superimposing includes deforming the deformable template.” The prior art does not disclose or suggest superimposing a deformable template representing a normative shape of an external surface of the hard tissue of interest to span the missing segment, where the template comprises a wireframe including ridge-curves and tiling curves, and where the superimposing includes deforming the deformable template.

The Office Action cites Ateshian col. 3, lines 26-39 and 40-54 as providing superimposed templates. (Office Action P. 2). However, the cited text says nothing about superimposing a deformable template.

Ateshian col. 3, lines 26-39 discloses “a method of manufacturing a joint prosthesis for a patient with a healthy contralateral joint.” (Ateshian, col. 3, lines 26-28). Ateshian col. 3, lines 40-54 discloses “a method of selecting, from a collection, a joint prosthesis for a patient with a healthy contralateral joint.” (Ateshian, col. 3, lines 40-42). Thus, the cited methods of Ateshian require that the patient have a healthy contralateral joint. The method of claim 1 does not require that the patient have a healthy contralateral joint or healthy contralateral tissue of any kind.

The cited text of Ateshian further discloses that the methods of manufacturing and selecting a joint prosthesis for a patient with a healthy contralateral joint comprise “obtaining imaging data of the patient’s healthy contralateral joint.” (Ateshian, col. 3, lines 26-28 and lines 43-44). Since amended claim 1 does not require that the patient has a healthy contralateral joint or healthy contralateral tissue of any kind, claim 1 does not require obtaining imaging data of the patient’s healthy contralateral tissue.

Ateshian discloses that the method of manufacturing a joint prosthesis for a patient with a healthy contralateral joint further comprises “comparing the imaged data of the patient’s healthy contralateral joint surfaces with a database of mathematical descriptions of a plurality of articular joint surface archetypes to determine which one of the plurality of articular joint surface archetypes exhibits the smallest deviation in overall dimension from the imaged data.” (Ateshian, col. 3, lines 30-35). The method disclosed in the cited text of

Ateshian concludes by “fabricating the joint prosthesis to resemble the articular joint surface archetype which exhibits the smallest deviation in overall dimensions from the image data.” (Ateshian, col. 3, lines 35-38).

Ateshian discloses that the method of selecting from a collection, a joint prosthesis for a patient with a healthy contralateral joint comprises “comparing the imaged data of the patient’s healthy contralateral joint surfaces with a database of mathematical descriptions of a plurality of articular joint surface archetypes to determine which one of the plurality of articular joint surface archetypes exhibits the smallest deviation in overall dimensions from the imaged data, and selecting, from the collection, the joint prosthesis which exhibits the smallest deviation in overall dimensions from the articular joint surface archetype which exhibits the smallest deviation in overall dimensions from the imaged data.” (Ateshian, col. 3, lines 44-54).

Therefore, the cited text of Ateshian discloses the use of the healthy contralateral joint surface information to determine which articular joint surface archetype, from a database or collection of articular joint surface archetypes, is dimensionally most similar to the healthy contralateral joint surface. (Ateshian, col. 3, lines 30-35 and lines 44-49). After determining the articular joint surface archetype with the smallest deviation from the healthy contralateral joint surface, a joint prosthesis is fabricated or selected to resemble the archetype. (Ateshian, col. 3, lines 35-38 and 49-54).

The cited text of Ateshian says nothing about deforming a deformable template, a feature of amended claim 1. What the Office Action refers to as the “template” of the cited text of Ateshian, the articular joint surface archetype, is not deformed, but simply selected from a database or collection of archetypes as the dimensionally most similar archetype from the archetypes in the database or collection. (Ateshian, col. 3, lines 30-35 and 44-54). This selection process does not involve deformation of a template as required by amended claim 1. Ateshian, does not disclose or suggest the amended claim 1 feature.

Amended claim 1 recites “the template comprises a wireframe including ridge curves and tiling curves.” Nowhere does the cited text of Ateshian discloses or suggests that the template comprises a wireframe including ridge curves and tiling curves.

Finally, amended claim 1 recites “determining an external shape of the implant as a function of respective shapes of the missing segment and the deformed template, where the implant is configured to fit within the contours of the missing segment.” The cited text of Ateshian discloses “fabricating the joint prosthesis to resemble the articular joint surface archetype which exhibits the smallest deviation in overall dimensions from the imaged data” (Ateshian, col. 3, lines 35-38) and “selecting, from the collection, the joint prosthesis which exhibits the smallest deviation in overall dimensions from the articular joint surface archetype which exhibits the smallest deviation in overall dimensions from the imaged data.” (Ateshian, col. 3, lines 44-54).

First, the cited text of Ateshian does not determine the external shape of the joint prosthesis as a function of two dimensions as amended claim 1 requires: determining an external shape of the implant as a function of respective shapes of the missing segment and the deformed template. The methods disclosed in the cited text of Ateshian fabricate or select the joint prosthesis to resemble the articular joint surface archetype which exhibits the smallest deviation in overall dimensions (Ateshian, col. 3, lines 35-38 and 44-54), not as a function of two other shapes, as required by claim 1.

Second, since what the Office Action refers to as the “template” of the cited text of Ateshian, the articular joint surface archetype, is not deformed, but simply selected from a database of archetypes as the dimensionally most similar archetypes from the archetypes in the database, the cited text of Ateshian cannot determine an external shape of the implant as a function of the shape of the deformed template, as required by claim 1.

For at least these reasons, the references of record do not disclose or suggest all of the limitations of claim 1. Claim 1 patentably distinguishes over the prior art.

Claims 2-9 depend from claim 1, which has been shown to patentably distinguish over the prior art. For at least this reason, claims 2-9 also patentably distinguish over the prior art.

#### Claim 10

Claim 10 as amended recites a “system for determining a shape of a medical device to be implanted into a subject.”

Claim 10 as amended recites “a template spanning the defective portion, the template representing a normative shape of an external surface of the hard tissue of interest, where the template is configured to deform to span the defective portion, where the template comprises a wireframe formed of ridge-curves and tiling-curves.” The Office Action cites Ateshian col. 3, lines 26-39 and 40-54 as providing superimposed templates. (Office Action P. 2). However, the cited text does not disclose the claim limitation.

The Office Action seems to refer to the articular joint surface archetype of Ateshian col. 3, lines 26-39 and 40-54 as a “template.” (Office Action P. 2). However, even assuming that the articular joint surface archetype of Ateshian col. 3, lines 26-39 and 40-54 is a template, the articular joint surface archetype is not configured to deform to span the defective portion. The articular joint surface archetype of the cited text of Ateshian is simply selected as the dimensionally most similar archetype from the archetypes in the database or collection. (Ateshian, col. 3, lines 30-35 and 44-54). This selection process does not involve deformation of a template to span the defective portion as required by amended claim 10. Ateshian, does not disclose or suggest the amended claim 10 feature.

Amended claim 10 recites “where the template comprises a wireframe formed of ridge-curves and tiling-curves.” Nowhere, does Ateshian disclose or suggest a template comprising a wireframe formed of ridge-curves and tiling-curves.

For at least these reasons, the references of record do not disclose or suggest all of the limitations of claim 10. Claim 10 patentably distinguishes over the prior art.

Claims 11-17 depend from claim 10, which has been shown to patentably distinguish over the prior art. For at least this reason, claims 11-17 also patentably distinguish over the prior art.

#### Claim 18

Claim 18 as amended recites a “method for repairing a defect in a hard tissue of interest included in a subject.”

Amended claim 18 recites “warping a template, having an average shape of the hard tissue of interest, over the defective and non-defective portions, where the template comprises a wireframe derived from ridge-curves and geodesic lines.” The Office Action



cites Ateshian col. 3, lines 26-39 and 40-54 as providing superimposed templates. (Office Action P. 2). (Office Action P. 2). However, the cited text does not disclose the claim limitation.

First, amended claim 18 recites “warping a template, having an average shape of the hard tissue of interest, over the defective and non-defective portions.” The Office Action seems to refer to the articular joint surface archetype of Ateshian col. 3, lines 26-39 and 40-54 as a “template.” (Office Action P. 2). However, even assuming that the articular joint surface archetype of Ateshian col. 3, lines 26-39 and 40-54 is a template, the articular joint surface archetype is not warped over the defective and non-defective portions, but simply selected from a database or collection of archetypes as the dimensionally most similar archetype from the archetypes in the database or collection. (Ateshian, col. 3, lines 30-35 and 44-54). This selection process does not involve warping of a template over the defective and non-defective portions as required by amended claim 18. Ateshian, does not disclose or suggest the amended claim 18 feature.

Second, amended claim 18 recites “where the template comprises a wireframe derived from ridge-curves and geodesic lines.” Nowhere, does Ateshian disclose or suggest a template formed of a wireframe derived from ridge-curves and geodesic lines.

For at least these reasons, the references of record do not disclose or suggest all of the limitations of claim 18. Claim 18 patentably distinguishes over the prior art.

Claims 19 and 20 depend from claim 18, which has been shown to patentably distinguish over the prior art. For at least this reason, claims 19 and 20 also patentably distinguish over the prior art.

**Conclusion**

For the reasons set forth above, the pending claims are in condition for allowance. An early allowance of all claims is earnestly solicited.

Applicant has submitted the fee for the extension of time and believes that no additional fees are due at this time. If there are any other fees due in relation to submittal of this communication, please charge to deposit account No. 02-2051, Docket No. 28728-65.

Respectfully submitted,

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